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# HIV/AIDS-Related Knowledge and Attitudes of Palestinian Women in the Occupied Palestinian Territory

Abdullatif Husseini, PhD; Niveen ME Abu-Rmeileh, PhD

**Objective:** To explore Palestinian women's knowledge, perceptions, and attitudes towards HIV/AIDS. **Methods:** Data used in this study were collected as a part of the Demographic and Health Survey (DHS) 2004 in the Occupied Palestinian Territory (OPT). **Results:** Most of the women in the OPT (93.4%) had heard of AIDS. They had fair general knowledge of HIV/AIDS prevention methods

and transmission. TV was the main source of information about HIV/AIDS. Among the determinants of HIV/AIDS knowledge identified by this study were education, region, and locality. **Conclusion:** A research-informed policy concerning HIV/AIDS prevention should be formulated

**Key words:** AIDS, knowledge, women, DHS, Palestine

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HIV/AIDS levels have reached alarming numbers all around the world. At the end of 2004, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) estimated the number of people living with HIV/AIDS to be 39.4 million. This corresponds to a prevalence of 1% among those aged 15-49 years.<sup>1</sup> The Occupied Palestinian Territory (OPT) belongs to the Eastern Mediterranean Region (EMR) of the WHO, which includes neighboring Asian and African countries. The estimated number of people living with HIV/AIDS in the EMR in 2003 was 700,000 with only 14,198 registered

cases.<sup>2</sup> The number of new cases of HIV in the Middle East and North Africa/Eastern Mediterranean region MENA/EM was approximately 83,000 in 2002 according to UNAIDS/WHO estimates.<sup>3</sup> The low prevalence in the EMR (estimated at 0.3%) among adults should not provide a false sense of immunity to HIV/AIDS.<sup>2</sup>

In the OPT the reported cumulative prevalence rate of AIDS/HIV was 1.75 per 100,000 in 2004.<sup>4</sup> The total number of reported cases since the first case was detected in 1988 until 2004 was 57 cases. Of those, 41 were AIDS cases and 16, asymptomatic HIV carriers.<sup>4</sup> According to the Ministry of Health (MOH) statistics, from the 57 cases the main mode of transmission was heterosexual relations, with 32 cases; followed by blood and blood products, with 10 cases, and drug injection, with 3 cases; bisexual relations, 2 cases; homosexual relations, one case; vertical transmission, one case; and unknown method of transmission, 8 cases.<sup>4</sup> Because of the large percentage of cases contracted through blood transfusion, all donated blood has been screened for HIV since 1994.<sup>5</sup> According to the MOH an-

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nual report 2004, most of the cases which contracted HIV/AIDS through blood transfusion had their transfusions abroad.<sup>4</sup> This low prevalence may be partially due to underreporting, probably influenced by stigmatization. Free HIV testing is available in the MOH laboratories, in addition to some private and nongovernmental organizations (NGOs) medical laboratories which offer the test. A study of blood donors conducted in the Gaza strip in 1999-2000 confirmed the low prevalence level of HIV/AIDS in that area.<sup>6</sup>

It should be emphasized that low prevalence is not equal to low risk, and examples from other countries such as Indonesia show that the epidemiology of HIV/AIDS can change rapidly.<sup>2</sup> It is obvious that despite the low prevalence in the region, there are a real risk of increasing HIV and an opportunity for action directed towards prevention while prevalence is still low.<sup>3</sup> Globalization, leading to more exposure to the outside world, Palestinian migrants living in high prevalence areas and frequently visiting the OPT, and changes of behaviors and decreasing commitment to moral codes regarding sex, especially extramarital sex, are factors that may play a role in increasing HIV/AIDS prevalence.

In addition to the human suffering and the loss of lives, there are huge economic effects related to HIV.<sup>3</sup> Prevention and dealing with misconceptions about modes of transmission were respectively identified as the top priorities in a study that aimed to assess information needs for HIV/AIDS and sexually transmitted diseases (STDs) in the EMR.<sup>7</sup>

Studies in the EMR identify heterosexual transmission as the major route of HIV infection, constituting around 80% of the total cases.<sup>2</sup> In the OPT, heterosexual transmission accounted for 54.5% of all cases reported until 2003, whereas homosexual and bisexual transmission accounted only for less than 6% of the cases.<sup>8</sup> Although in the early days of the AIDS global epidemic most of those infected were men, in 2004 nearly 50% of adults living with HIV in the world were women.<sup>9</sup>

Women living with HIV/AIDS in the Middle East and North Africa at the end of 2004 were estimated to be 250,000 women.<sup>10</sup> In the OPT, most of the registered cases (80%) were men.<sup>8</sup> Still it is very important to utilize available Demographic and Health Survey (DHS) data on

women because most of the transmission of HIV/AIDS in the OPT is heterosexual.

Culture is considered an initial concept for understanding and preventing HIV/AIDS,<sup>11</sup> an important determinant of sexual behavior, and culture plays an important role in prevention. Prevention programs should be scientifically sound and culturally acceptable, including interventions supported by the culture such as abstaining from extramarital sex. Since the early nineties there were some studies in the region aiming to answer some of the important questions concerning HIV/AIDS knowledge, attitudes, and practices.<sup>12,13</sup> Despite these initial initiatives, there are still some gaps in research and literature regarding this issue. This is especially true in the MENA/EM region. "Little substantial HIV-related social or behavioral research has taken place in the region," and most of the published HIV-related research focuses on clinical and biomedical issues,<sup>3</sup> as opposed to a focus on knowledge, attitudes, and perceptions, key to the prevention of HIV/AIDS and to health promotion overall.

The objectives of this analysis of the DHS data on HIV/AIDS, completed in the OPT in 2004, are to assess knowledge of HIV/AIDS in terms of prevention, transmission, and prognosis and determine its main sources of information and explore its determinants; to appraise local attitudes towards people infected with HIV/AIDS; and to assess the perception of self-risk among participants. DHS is widely used in assessing knowledge about HIV/AIDS. Detailed information about the use and adequacy of DHS in HIV/AIDS knowledge is available in the "Discussion" section.

## METHODS

### Demographic Health Survey (DHS)

Data from the DHS 2004, conducted by the Palestinian Central Bureau of Statistics (PCBS), was used to complete this analysis. The questionnaire was developed by PCBS utilizing standard DHS questionnaires with certain modifications. The process of using and adapting the DHS by the Palestinian Central Bureau of Statistics started in 1995. The target population was all Palestinian households living in the West Bank and Gaza. The targeted population was ever-married women 15-54 years old.

The number of households in the

**Table 1**  
**Items Composing HIV/AIDS Knowledge/Perception and Attitude Measurement Tool**

**Items**

- 1 Have you ever heard about a disease known as AIDS (Acquired Immune Deficiency)?
- 2 From which sources have you heard information about AIDS?
  - Radio .....
  - TV .....
  - Newspapers/magazines .....
  - Brochures/posters .....
  - Health workers .....
  - Lectures .....
  - Religious places .....
  - Schools/teachers .....
  - Public gatherings .....
  - Friends/relatives .....
  - Workplace .....
  - Other (specify) .....
- 3 Is there anything one can do to prevent getting infected with HIV/AIDS?
- 4 Which of the following things can help prevent AIDS?
  - A. Using a condom .....
  - B. Having sex only with husband ...
  - C. Avoiding blood transfusion .....
  - D. Avoiding injections .....
  - E. Avoiding kissing .....
  - F. Abstinence from having sex .....
  - G. Avoiding handshaking .....
  - H. Avoiding mosquito bites .....
  - I. Seeking protection from the disease at traditional healers .....
  - J. Avoiding talking to infected peopleK. Avoiding tattoos .....
  - L. Avoiding ear/nose piercing .....
  - M. Avoiding going to the dentist
- 5 Is it possible that a person with apparently good health may have HIV?
- 6 Do you think AIDS patients do not die, sometimes die or always die because of this disease?
- 7 Do you think your chance to get infected with AIDS is low?
- 8 Is it possible for AIDS to be transmitted from the mother to her baby?
- 9 How may AIDS transmission occur? 1- Yes, 2- No, 3- Don't Know
  - A. During pregnancy .....
  - B. During delivery .....
  - C. During breast-feeding .....
  - D. Other (specify) .....
- 10 If a teacher is infected with HIV virus but does not show any symptoms, should he/she be allowed to continue teaching at school?
- 11 If you know a shopkeeper is infected with HIV/AIDS, would you buy food from him/her?
- 12 Currently, do you know a place where testing for AIDS is provided?

sample was 6574 households: 4456 in the West Bank and 2118 in the Gaza Strip. The sample was a stratified 2-stage random sample: the first stage was composed of 260 enumeration areas (EA) which were selected from all the OPT (Gaza Strip and the West Bank including Jerusalem). The second stage was composed of a sys-

tematic random sample of 25 households selected from each EA in the West Bank and the Gaza Strip and 30 households for Jerusalem. An overall response rate of 88.2% was achieved. The reference date for the DHS was 17/05/2004.

All ever married women, comprising 4967 subjects, were asked the questions

**Table 2**  
**Demographic Characteristics of the DHS 2004 Sample (N=4967)**

Characteristic	Frequency	Percentage
<b>Age</b>		
15-24	1080	21.7
25-34	1751	35.3
35-44	1383	27.8
45-54	753	15.2
<b>Marital status</b>		
Married	4758	95.8
Divorced	79	1.6
Widowed	109	2.2
Separated	21	.4
<b>Education</b>		
Below secondary	3170	66.3
Secondary and above	1608	33.7
<b>Employment</b>		
Ever employed including current students	574	11.6
Not employed and housewives	4393	88.4
<b>Region</b>		
West Bank	3082	62.0
Gaza Strip	1885	38.0
<b>Type of locality</b>		
Urban	2803	56.4
Rural	1346	27.1
Camp	818	16.5

contained in the AIDS section. In this section, there were 12 questions on HIV/AIDS knowledge, attitudes, and sources of information.

### Indicators

The questions utilized in the AIDS section covered knowledge, attitudes, and self-risk perceptions. In addition to the use of single indicators of the above-mentioned measures (eg, heard of HIV/AIDS), composite indicators were also calculated.

**Composite indicators.** Knowledge indicator 1 (knowledge of HIV prevention), which is a core indicator: "The percent of all respondents who, in response to prompted questions, say that a person can reduce their risk of contracting HIV by using condoms or having sex only with one faithful uninfected partner".<sup>14</sup> Knowledge indicator 2 (no incorrect beliefs about AIDS), which is another core indicator: "The percent of all respondents who correctly reject the 2 most common local misconceptions about AIDS transmission or prevention and who know that a healthy

looking person can transmit AIDS".<sup>14</sup> These 2 most common local misconceptions were defined in the results. For the exact phrasing of the questions please refer to Table 1

It is important to note that for all indicators of AIDS-related knowledge, the denominator used was the entire population of respondents, and not only those who have heard of AIDS. "This is because those who have not heard of AIDS (and who therefore cannot have any 'correct' knowledge about it) definitely represent failure of the IEC campaigns."<sup>14</sup>

Statistical analysis included basic descriptive measures such as means, standard errors, and frequencies. The sample was not weighted in the analysis of this study. Three important dependent (outcome) variables were selected for analysis, in order to explore their association with independent explanatory variables. The dependent variables were having "heard of AIDS" and 2 composite indicators of AIDS knowledge. The explanatory variables included age (15-34; 35-54), region (West bank; Gaza Strip), education

**Table 3**  
**Knowledge About HIV/AIDS**

Item	Percentage		
	Yes	No	Do not know
Have you heard about AIDS?	93.4	6.6	NA
Is there any thing a person can do to avoid HIV/AIDS?	73.7	7.7	11.9
Can a person of apparently good health be infected with HIV?	48.1	34.2	11.0
Currently, do you know a place where testing for AIDS is provided?	14.7	59.0	19.8
Can AIDS be transmitted from mother to child?	76.3	8.1	9.0
Can AIDS have MTCT through pregnancy?	70.9	2.4	2.9
Can AIDS have MTCT through delivery?	58.2	9.2	8.6
Can AIDS have MTCT through breast-feeding?	50.9	16.5	8.9
<b>Items reflecting knowledge of prevention methods</b>			
Avoiding blood transfusion	66.1	5.9	1.7
Having sex with husband only (single partner)	61.3	10.1	2.4
Avoiding injections	60.2	10.0	3.5
Using condoms	43.3	18.1	12.2
Avoiding tattooing	43.3	21.1	9.3
Avoiding mosquito bites	34.5	30.0	9.3
Avoiding kissing	31.9	36.2	5.7
Avoiding visiting the dentist	31.6	36.8	5.3
Avoiding piercing ear and nose	30.7	35.1	8.0
Complete abstinence from sex	26.2	43.3	4.3
Avoiding talking to the infected	15.8	54.8	3.1
Avoiding hand shaking	13.8	56.6	3.4
Seeking help from traditional healers	12.2	54.0	7.5

**Note.**

The percentage does not add up to 100% because the denominator is the total number of participants of the study, rather than just those who have heard of AIDS.

(below secondary; secondary and above), locality (urban; rural; camp) and employment (employed including students; un-employed).

Chi-square tests and logistic regression analysis (Enter method) were used to assess the association between the 3 outcome variables "heard of AIDS," knowledge indicator 1, and knowledge indicator 2 and the selected explanatory variables. In all analysis the Statistical Package for Social Sciences (SPSS) version 13.0 was used.

## RESULTS

### Characteristics of the Subjects

All participants were either currently or previously married women living in the OPT at the time of the survey. Sixty-two percent of the sample came from the West Bank, whereas 38% were from the Gaza Strip. The majority of women were

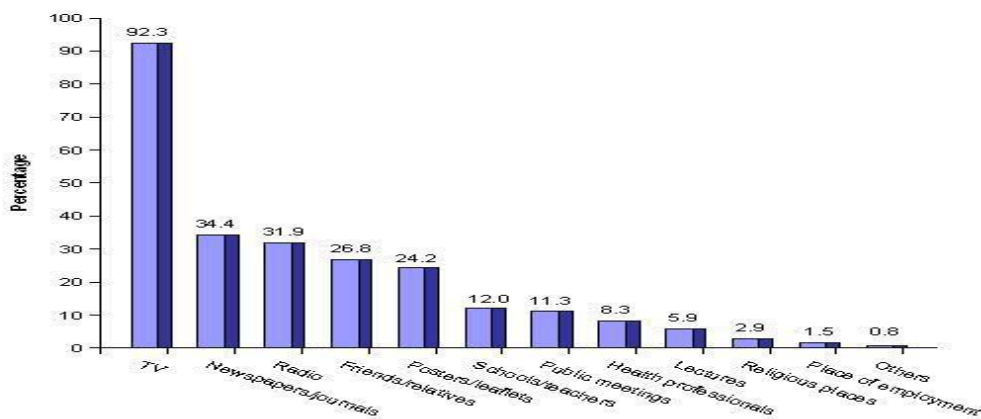
nonrefugees (57.8%), whereas the rest (42.2%) were refugees and reflecting the overall refugee population in the OPT. The mean age  $\pm$  SE =  $33.3 \pm 0.136$  years, and the mean  $\pm$  SE of years of education was  $9.9 \pm 0.046$ . Further details are available in Table 2.

### Knowledge About HIV/AIDS

Three hundred twenty-eight (6.6%) participants in this study had not heard about AIDS. Although this percentage is low, it nevertheless reflects the need for communicating the basic messages about AIDS to all the public. About three quarters of the total study participants responded positively when asked if infection with HIV/AIDS could be prevented. Knowledge of mother-to-child transmission of AIDS was also assessed. Again, a high of 76.3% reported that mother-to-child transmission is possible. However,



**Figure 1**  
**Sources of Information About HIV/AIDS**



responses to the questions dealing with the mode of transmission of HIV/AIDS from mother to child varied from 50.9% who said that it can be transmitted by breast-feeding to 70.9% who thought that it can be transmitted during pregnancy. Only 48.1% answered yes to the question that an apparently healthy person could be infected with HIV. These results demonstrate that there are important information gaps among Palestinian women on HIV/AIDS.

Only around 15% knew of an HIV testing site in their locale or country. The MOH makes at least one governmental testing site available in each district, in addition to many private medical laboratories. This low percentage reflects the need to better inform Palestinian women of available testing and other relevant services in their districts.

**Knowledge About Prevention Methods and Misconceptions About HIV/AIDS Transmission**

Because 73.7% of the participants stated that HIV/AIDS is preventable, some questions were asked to assess the participants' knowledge of specific prevention methods and some of the common misconceptions about transmission of AIDS. Avoiding blood transfusion (66.1%), having sex with a single partner (61.3%),

and avoiding injections (60.2%) ranked highest among prevention methods for HIV/AIDS. Those were followed by using condoms, where 43.3% of the participants stated that this was useful in prevention. Most of the participants answered no when asked if avoiding talking to an infected person (54.8%) or shaking his hands (56.6%) will help in HIV/AIDS prevention.

**Sources of Knowledge About HIV/AIDS**

The main source of information about HIV/AIDS for those who answered yes to having heard about AIDS was the television (92.3%), nearly 3 times higher than its second ranking source, which was newspapers and journals (34.4%).

**Perceptions About HIV/AIDS: Self-risk of Infection and Fatality**

Only 0.5% of those who have heard of AIDS perceived their risk of getting infected as high, whereas the majority (86.3%) thought that they were at no risk. HIV/AIDS was described as always fatal by 62.0% and some times fatal by 23.1% of the participants of the study.

**Attitudes Towards People Infected With HIV/ AIDS**

Of those who have heard of AIDS, only a quarter thought that an apparently healthy HIV-infected teacher should be

**Table 4**  
**Selected Factors Associated With AIDS Knowledge**

Item	Heard of HIV/AIDS (%)	Knowledge <sup>b</sup> indicator 1	Knowledge <sup>b</sup> indicator 2
<b>Region</b>			
West Bank	95.5 <sup>a</sup>	52.7	15.8 <sup>c</sup>
Gaza strip	89.9	51.8	12.8
<b>OR (95%CI)</b>	2.39 (1.91-3.01)	1.04 (0.91-1.18)	12.8(1.06-1.56)
<b>Age</b>			
15-34	94.4 <sup>a</sup>	51.3	16.4 <sup>a</sup>
35-54	92.0	53.8	12.2
<b>OR (95%CI)</b>	1.46 (1.17-1.83)	0.90 (0.79-1.03)	1.42 (1.17-1.72)
<b>Education</b>			
Secondary and above	98.0 <sup>a</sup>	55.6 <sup>a</sup>	19.2 <sup>a</sup>
Below secondary	92.2	50.5	11.9
<b>OR (95%CI)</b>	4.16 (2.87-6.05)	1.23 (1.08-1.41)	1.77 (1.47-2.13)
<b>Employment</b>			
Ever employed	97.6 <sup>a</sup>	56.9 <sup>a</sup>	22.2 <sup>a</sup>
Not employed	92.9	51.6	13.5
<b>OR (95%CI)</b>	3.08 (1.79-5.30)	1.24 (1.02-1.50)	1.84 (1.46-2.32)
<b>Refugee status</b>			
Registered refugee	93.7	51.1	14.6
Nonrefugee	93.0	53.1	14.4
<b>OR (95%CI)</b>	0.91 (0.72-1.14)	1.08 (0.94-1.24)	0.99 (0.82-1.19)
<b>Locality</b>			
Urban	92.5 <sup>c</sup>	53.6	13.0 <sup>c</sup>
Rural	94.5	50.0	16.7
<b>OR (95%CI)</b>	1.39 (1.06-1.83)	0.87 (0.74-1.01)	1.34 (1.08-1.66)
Camp	94.6	51.6	17.0
<b>OR (95%CI)</b>	1.43 (1.02-1.99)	0.92 (0.77-1.10)	1.37 (1.07-1.74)

**Note.**

**a**  $P < 0.005$  using  $\chi^2$  test

**b** Only among those who have answered the relevant questions and not the entire respondents

**c**  $P < 0.05$  using  $\chi^2$  test

allowed to teach in schools. A small minority of 15.2% said that they would buy food from a shopkeeper infected with HIV.

**Composite indicators of knowledge.**

Two main knowledge indicators were calculated. Knowledge indicator 1 referred to the percentage of those who positively responded to the question that a person can reduce his risk of contracting HIV by using condoms and having sex with one partner (husband); and knowledge indicator 2 (no incorrect beliefs about AIDS) referred to the percent of all women who

correctly rejected the 2 most common local misconceptions about AIDS transmission or prevention (kissing and mosquito bites) and who reported that an apparently healthy-looking person can be infected with HIV. In order to have a correct answer to knowledge indicator 2 the respondent must correctly reject the 2 most common misconceptions that were determined by results obtained from participants' responses and also indicate that an apparently healthy person can be infected with HIV.



**Table 5**  
**Logistic Regression Model for Selected Factors**  
**Associated With AIDS Knowledge**  
**(refugee status included)**

Item	OR (95% CI)		
	Heard of HIV/AIDS (%)	Knowledge indicator 1	Knowledge indicator 2
<b>Region</b>			
West Bank	3.90 (2.85-5.33)	1.10 (0.95-1.29)	1.43 (1.12-1.82)
Gaza strip	Ref =1	Ref =1	Ref =1
<b>Age</b>			
15-34	1.24 (0.97-1.60)	0.85 (0.74-0.98)	1.35 (1.11-1.65)
35-54	Ref =1	Ref =1	Ref =1
<b>Education</b>			
Secondary and above	4.35 (2.94-6.44)	1.20 (1.04-1.39)	1.64 (1.34-2.02)
Below secondary	Ref =1	Ref =1	Ref =1
<b>Employment</b>			
Ever employed	1.66 (0.86-3.21)	1.14 (0.93-1.41)	1.43 (1.10-1.86)
Not employed	Ref =1	Ref =1	Ref =1
<b>Refugee status</b>			
Nonrefugee	0.72 (0.53-.98)	1.14 (0.96-1.35)	0.97 (0.76-1.24)
Registered refugee	Ref =1	Ref =1	Ref =1
<b>Locality</b>			
Rural	0.93 (0.66-1.32)	0.86 (0.73-1.02)	1.24 (0.98-1.57)
Camp	1.43 (0.97-2.11)	1.05 (0.86-1.29)	1.54 (1.15-2.05)
Urban	Ref =1	Ref =1	Ref =1

The score achieved by the participants in DHS 2004 for knowledge indicator 1 was 38.6%, whereas the score for knowledge indicator 2 was much lower, a mere 10.8% among the entire respondents population regardless of whether they had heard about AIDS or not.

#### **Determinants of Knowledge About HIV/AIDS**

Statistically significant association was found between having heard of AIDS, which is the first single indicator of AIDS knowledge, and the following independent variables—region, education, employment, locality type (urban, rural, camp), and age—based on the chi-square test  $\chi^2$ . When the same test was applied to knowledge indicator 1, both education and employment were statistically significant, whereas the 3 others were not.

All the explanatory variables had also

statistically significant associations with knowledge indicator 2 using chi-square test  $\chi^2$ .

Multiple logistic regression analysis results are outlined in Table 5. Each model included region, age, education, employment, refugee status, and locality as explanatory variables. “Heard of AIDS” was associated with region, education, and locality adjusted for other variables in the model. Knowledge indicator 1 was associated with education and age in the logistic regression analysis whereas knowledge indicator 2 was associated with all the explanatory variables except refugee status.

#### **DISCUSSION AND IMPLICATIONS**

The use and adequacy of DHS for measuring HIV/ AIDS knowledge and attitudes is well established. Until 2004 more than 170 surveys were conducted by the

DHS program in about 70 countries of the world.<sup>15</sup> Many of these studies included components related to HIV/AIDS knowledge, attitudes, beliefs, and behavior, targeting women in the reproductive age. Various studies discussed the importance and the quality of sexual behavior indicators.<sup>15,16</sup> Stigma discrimination indicator 1 could not be calculated from the Palestinian DHS 2004 because only 2 out of 4 questions needed to calculate the indicators were included in this survey.<sup>14</sup> The reasons for such exclusions could have been due to cultural sensitivity and the low reported prevalence of HIV/AIDS in the OPT. In future DHS in the OPT, including culturally acceptable questions about both attitudes and sexual behavior is recommended.

The response rate obtained in the Palestinian DHS was 88.2%, which is close to rates in other studies around the world. Usually high response rates above 90% are obtained in population-based HIV surveys including DHS.<sup>17</sup> Ninety-three percent of respondents reported that they had heard of AIDS. This number is comparable to those in other countries in the region. In Egypt 96% of the family planning clients have heard of AIDS,<sup>13</sup> whereas in Sana'a city, Yemen, 12% of women reported that they have not heard of AIDS.<sup>18</sup> This is nearly twice the number of women who have not heard of AIDS in Palestine. However, the fact that about 7% of respondents have not heard of AIDS indicates that more efforts should be placed in better informing Palestinian women of AIDS prevention.

Key questions related to AIDS prevention include whether people know how HIV/AIDS is transmitted. How can it be prevented? In this study 73.7% answered yes when asked if HIV transmission prevention is possible, whereas 7.7% answered no and 11.9% did not know. The total of the percentages were not 100%, because the denominator includes those who have not heard of AIDS. This means that more than a quarter of women asked did not have enough information that HIV/AIDS could be prevented. In contrast, 90% of family planning clients in Egypt knew that HIV/AIDS can be avoided.<sup>13</sup> It is important to note that family planning clients are generally younger and more exposed to HIV/AIDS knowledge.

Less than one half of respondents in

this study reported that an apparently healthy person could be infected with HIV. A similar result of 46% was obtained from a study conducted in Yemen on males and females aged 14-50 years.<sup>18</sup> A much higher result of 84.3% was reported among pregnant Chinese women in Hong Kong.<sup>19</sup> The results from the OPT demonstrate that AIDS knowledge levels are low when compared with those of Hong Kong.

Four questions were asked about mother-to-child transmission of HIV/AIDS. A total of 76.3% reported that HIV/AIDS can be transmitted from mother to child. Pregnancy was identified as means for transmission of HIV from mother to fetus by 70.9% of the participants in the current study compared to 96.9% who answered yes to a similar question in a study of pregnant Chinese women in Hong Kong.<sup>19</sup> In addition to the fact that the participants in the Hong Kong study were younger with a mean age of 29.61 years compared to 33.3 years in our study, the higher prevalence of HIV/AIDS and the more advanced HIV/AIDS health education programs may explain this knowledge difference. The same applies to the transmission through delivery, with 58.2% of participants in the Palestinian DHS 2004 answering yes to the question compared to 90.1% in Hong Kong.<sup>19</sup> The percentage of women who knew that HIV can be transmitted through breast-feeding was 51%. A similar result of 54% was obtained from a study on women of child-bearing age in India.<sup>20</sup>

When asked about methods that can help in preventing HIV/AIDS, 61.3% of the total number of participants in the study identified having sex with husband only (a single partner), whereas only 43.3% answered yes to the use of condom. In Hong Kong the results of the same 2 prevention methods were 79.1% and 78.5% respectively.<sup>19</sup> Thus AIDS prevention knowledge in the OPT is low, especially the knowledge about the benefits of condom use. Although information about extramarital sex in Palestine is not available, and it is assumed to be at a very low level because of cultural and social sanctions, it is very important to communicate the right information about HIV/AIDS prevention, especially to youth. It is equally important to include males in future HIV/AIDS studies in order to understand the total picture. The question itself (having sex with husband only) is

not well phrased. Further efforts should be exerted to develop a scientifically sound and culturally acceptable question.

Other factors which ranked high among identified prevention methods were avoiding blood transfusion, injections, and tattooing. The most common misconceptions were that avoiding mosquito bites and avoiding kissing may help in preventing HIV/AIDS, with about a third of the participants answering yes when asked about those 2 items.

The knowledge indicator 1 score was 38.6%, which was almost identical to results of 39% among women aged 15-49 years obtained from Albania's multiple indicators cluster survey conducted in the year 2000.<sup>21</sup> Data from Armenia 2000 and Burkina Faso 2003 DHS were both higher, scoring 44% and 45 % respectively.<sup>22,23</sup> In Indonesia DHS 2002-2003, knowledge indicator 1 was lower scoring 19% only.<sup>24</sup> The knowledge indicator 1 results in the Palestinian DHS score indicate that efforts should be made to improve knowledge about HIV/AIDS. The same applies to knowledge factor 2 (no incorrect beliefs about AIDS) with only 10.8% of the total participants answering it correctly. In the Armenian DHS 2000, female participants aged 15-49 years scored 8.0% on this indicator,<sup>22</sup> whereas the score among the same group in Burkina Faso was 17.0%.<sup>23</sup> This also testifies to the need for a clear national policy on HIV/AIDS prevention that should target especially youth using school-based education programs because the gross enrollment ratio in both basic and secondary schools for students in the OPT was 90.3% in the school year 2004/2005.

Only 2 questions were asked about accepting attitudes towards people infected with HIV/AIDS. The percentage of those who answered yes to allowing a teacher who is infected with AIDS but does not show any symptoms to continue teaching at school was 25.4%, which was comparable to Albania with 24% and much higher than in Armenia with 10%.<sup>21,22</sup> However, the question in the Palestinian DHS did not define the sex of the teacher, contrary to the studies from Albania and Armenia, which specified a female teacher. The second question was "Would you buy food from a shopkeeper infected with HIV?" Only 15.2% of the respondents in the current study answered yes to this question. This was slightly higher than

in Albania, where 12 % of the women aged 15-49 years participating in the MICS had a positive answer.<sup>21</sup> Again, the question in the Albanian MICS specified fresh vegetables whereas the Palestinian DHS asked about food in general. In future studies in Palestine more indicators of accepting attitudes should be included in order to enhance our understanding of this issue.

The most common source of information about HIV/AIDS in the current study was the television followed by newspapers and radio, similar to results from a study conducted in Yemen.<sup>18</sup> This was confirmed by an information-needs assessment on HIV/AIDS in the EMR, which identified television and radio as the most suitable media for health promotion and education.<sup>7</sup> Thus the use of television for conveying HIV/AIDS prevention messages in the OPT is recommended, because it is the source of information about AIDS for about 90% of respondents. An interesting finding was that only 8.3% of respondents had health professionals as their source of information. Although health professionals, especially from MOH and some nongovernmental organizations (NGOs), have produced and distributed health promotion materials about HIV/AIDS and were involved in other HIV/AIDS-related health promotion efforts, it seems that less emphasis is given to it due to the low incidence of HIV/AIDS in the OPT. A new source of information that is becoming prevalent in the OPT is the Internet, especially among the youth. In forthcoming studies it may be worthwhile to specifically ask respondents about this particular new source of information.

Understanding the determinants of HIV/ AIDS knowledge can provide an important contribution for improving the methods used to convey knowledge and affect attitudes and behavior concerning HIV/AIDS. In both simple cross-tabulations and logistic regression analysis utilizing various explanatory variables, education was significantly associated with all the 3 outcome variables "heard of AIDS" and knowledge indicators 1 and 2. This emphasizes the role of education as a major determinant of HIV/AIDS knowledge. Education was also found to be a significant determinant of AIDS knowledge in a study of knowledge, attitudes, and beliefs about HIV/AIDS conducted in Yemen, which is a predominantly Arab

Muslim country located in the EMR with low prevalence of HIV/AIDS.<sup>18</sup>

More knowledge about HIV/AIDS was noted among those living in camps who are refugees served by UNRWA. This may probably be due to the emphasis given by UNRWA to HIV/AIDS knowledge. In both "heard of AIDS" and knowledge factor 2, the association stayed significant after controlling for confounding using logistic regression analysis.

Factors significantly associated with knowledge indicator 1 controlling for other variables in the logistic regression analysis were education and age. In contrast to "heard of AIDS" and knowledge indicator 2, younger age scored lower in knowledge indicator 1. This may be explained by the fact that knowledge indicators 1 and 2 are measuring 2 different types of knowledge that may not be highly correlated. However, factors associated with both "heard of AIDS" and knowledge factor 2 were consistent as shown in tables 4 and 5

In addition to education, discussed above, the explanatory variables region, age, employment, and camp locality continued to be statistically associated with knowledge indicator 2 after controlling for confounding variables. Women who were more educated, living in the West Bank, employed, and aged 15-34, scored higher in Knowledge indicator 2. Concerning age, it is noted that younger Palestinians are more educated, and we have witnessed a sharp rise in the educational levels of women in the recent past. Younger women aged (15-34) have more access to information about HIV/AIDS through school, peers, and the ability to utilize other resources such as surfing the Internet for information. Even in the most developed countries such as the United States it has been noted that older women have lower levels of knowledge about HIV/AIDS.<sup>25</sup>

Explaining employment-association HIV/AIDS is related to the fact that the employed usually have better education and because of that the association between employment and "heard of AIDS" and knowledge factor 1 shown in the simple cross-tabulations disappeared after controlling for confounding in the logistic regression analysis.

This study has shown that there is a need to better inform the Palestinian women of HIV/AIDS, including transmission and prevention. The most important modifiable determinant is education.

Combined efforts of all stakeholders including governmental institutions (ministries), UNRWA, and NGOs should target this determinant.

The Palestinian Ministry of Education and Higher Education (PMoEHE) is collaborating with the Ministry of Health (MOH), UNFPA and UNICEF to formulate a policy concerning reproductive health and sex education in the Palestinian schools. Within this policy, they are aiming to introduce an HIV/AIDS education program, as a cross-cutting issue in the curricula of various subjects. (Personal communication with Ihab Shukri, the director of the health education at PMoEHE, July 15, 2005). The PMoEHE implemented a pilot project on HIV/AIDS education on the 10<sup>th</sup> and 11<sup>th</sup> classes in secondary level.

Based on the results of this study, it is recommended to formulate a national policy on HIV/AIDS prevention that integrates all the efforts of different stakeholders. Further studies covering the whole Palestinian community including both sexes, with emphasis on youth, is important to ensure evidence-based national policy. These studies should emphasize culturally appropriate, internationally comparable, and more comprehensive questionnaires covering attitudes and behavior, to be able to attain a clearer understanding of those issues.

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